A Study on Development Plan of ICT Education in Korea

Woochun Jun

Abstract

In a knowledge-based society, advances in information and communication technology (ICT) require new paradigms in our society. In order to adapt to the current knowledge-based society, people must be familiar with ICT. In this sense, schools are responsible for educating students to how to deal with ICT in every aspect of their lives. In this paper, current status and future directions of ICT education in Korea are discussed. First, current status of ICT education is discussed. Two types of ICT education, literacy education and application education are introduced. Then, infrastructures supporting for adapting ICT use in education are introduced. Those infrastructures include laws and regulations, support for outstanding Municipal and Provincial Offices of Education, and educational information standardization, respectively. Finally, conclusions and future directions of ICT education in Korea are discussed.

1. Introduction

In a knowledge-based society, fostering individuals who are able to create and share information can enhance national competitiveness. In order to foster such individuals, educational reforms must be required. To support educational reforms effectively, the following factors must be considered in national educational system [1]. First, it is important to foster individual with self-study ability. Second, it is necessary to raise individuals with creative thinking and problem-solving ability. Third, each individual must deal with the global world. Fourth, it is important to realize that everyone belongs to a community.

In a knowledge-based society, ICT can support synthetic management of tremendous data that can be utilized by human. In the long run, ICT is an essential technique to the process of collecting, processing, analyzing and organizing data. In education, ICT can provide many benefits. It can overcome the problem of time and space limits existing in traditional classrooms, provide new and diverse information to both students and teachers, support students’ individual study and cooperation work, and provide authentic circumstances [2].

ICT education in elementary and secondary schools is recommended
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according to “Adapting ICT into Education Master Plan and the Promotion Plan for using ICT in Schools” initiated by MOE & HRD (Ministry of Education and Human Resources Development) in Korea. Note that MEST (Ministry of Education, Science and Technology) has taken over the roles of MOE & HRD since 2007. Four goals to be achieved by introducing ICT are as follows [3]. The first goal is to encourage ICT use by fostering ICT application capability of teachers and providing education contents to all courses using personal computers distributed to all classes and Internet. The second goal is to construct teaching-learning support system for all courses and raise quality of teaching-learning by building distance education support system for schools in remote villages and optional courses. The third goal is to support supplementary study and independent study at home by providing autonomous study support system and supplementary class support system for slow learners. The final goal is to foster activation of ICT use by establishing policies by specialists on education and by providing systematic teaching-learning methods of ICT education.

In order to support above goals, the following principles must be followed. Firstly, it is important to develop ICT application capability. It is also necessary to support teaching-learning methods of ICT application and provide standardization of ICT application. Secondly, it is necessary to develop and distribute educational information. In order to support development and distribution of educational information, it is important to activate educational software market for private companies and provide financial support for encouraging educational software purchase. Thirdly, it is desirable to construct cyber teaching-learning support system. In order to gradually alleviate the cost for private tutoring, it is important to improve teaching-learning method by ICT use and systematically support autonomous study at home. Fourthly, we need to induce activation of ICT application education. In order to activate ICT use in education, it is necessary to develop various ICT application education models and exemplary teaching-learning guidelines in courses. Also, it is encouraged to establish model schools for encouraging research on ICT use in education.

In this paper, current status and future directions of ICT education in Korea are discussed. This paper is organized as follows. In Section 2, current status of ICT education in Korea is discussed. Especially, the necessity of ICT education, and two types of ICT education are presented. Also, in Section 3, infrastructures supporting for adapting ICT use in education are presented. Finally, conclusions and future directions of ICT education in Korea are issued in Section 4.

2. Current Status of ICT Education in
Korea

In this section, current status of ICT education in Korea is discussed. The current status of ICT education is discussed in terms of literacy education and application education.

ICT education implies education based on computer and communication tools for current knowledge and information society [4,5]. ICT education can be classified into two categories: ICT literacy education and ICT application education. ICT literacy education means education about computers and information communication. On the other hand, ICT application education is an education for applying ICT to courses in various subjects such as math, science, and foreign languages.

The objective of ICT education is to provide capability for collecting and analyzing information necessary to each person, and let everyone use this capability to enjoy active and creative life [4]. In order to achieve this objective, ICT should be used to teach every class in school.

2.1. ICT Literacy Education

The “Basic Curriculum for All Citizens” presents a systematic ICT literacy education contents as follows [6]. The contents are classified into 5 stages and 5 topics. Stage 1 to 5 respectively represents 1st-2nd grades, 3rd-4th grades, 5th-6th grades, 7th-9th grades, and 10th grades. On the other hand, 5 topics are “Understanding Information and ICT Ethics”, “Basic PC Skills”, “Using Software Programs”, “PCs and the Internet” and “General Activities”, respectively. Schools are recommended to establish and manage ICT literacy education plan considering the actual circumstances in schools, differences in students’ capabilities and relevance among courses, etc. <Table 1> shows contents for ICT literacy education in elementary and secondary schools recommended by MOE & HRD in 2000.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Stage 1 (1st-2nd grade)</th>
<th>Stage 2 (3rd-4th grade)</th>
<th>Stage 3 (5th-6th grade)</th>
<th>Stage 4 (7th-9th grade)</th>
<th>Stage 5 (10th grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding information and ICT ethics</td>
<td>-Understanding information tools&lt;br&gt;-Information and Life</td>
<td>-Concept of information&lt;br&gt;-Understanding information ethics</td>
<td>-Attitude and manner of information application&lt;br&gt;-Selection and application of true information</td>
<td>-Information ethics and copyright&lt;br&gt;-Understanding concept of knowledge-based society</td>
<td>-Sharing of sound information&lt;br&gt;-Knowledge-based society and changes in jobs</td>
</tr>
<tr>
<td>Basic PC skills</td>
<td>-Constituent elements of computers</td>
<td>-Basics on operating system</td>
<td>-Understanding hardware and software</td>
<td>-Software upgrade</td>
<td>-Understanding various operating</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Using software programs</th>
<th>PCs and the Internet</th>
<th>General activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Application study of educational software</td>
<td>- Basic operation methods of the Internet</td>
<td>- Data collection and application using communication</td>
</tr>
<tr>
<td>- Document production and management using word processor</td>
<td>- E-mail and information sharing</td>
<td>- Information search and application - Cooperative project study</td>
</tr>
<tr>
<td>- Basics on multimedia</td>
<td>- Advanced functions and applications of word processor</td>
<td>- Conversion of data form - Homepage production</td>
</tr>
<tr>
<td>- Basic functions of presentation software</td>
<td>- Application of spreadsheet software - Basic functions of database - Application of multimedia</td>
<td>- Participation and activities on cyberspace - Search and applications of various information</td>
</tr>
<tr>
<td>- Application of various educational software - Application of presentation software</td>
<td>- E-mail management and the Internet environment setup</td>
<td>- Production of Internet class newspaper - Maintenance and management of homepage</td>
</tr>
</tbody>
</table>

However, ICT literacy education based on above contents has the following problems. Firstly, it was an application-oriented curriculum rather than literacy-oriented. Although it is designed for literacy education, it contains more application-oriented contents. Secondly, the contents for each topic are too general. It means that it is up to teachers to decide and select specific study contents in each topic.

In order to solve the above problems, ICT literacy education contents have been updated by MOE & HRD in 2005[7]. The contents are summarized in <Table 2>.
### Contents for ICT literacy education released in 2005 [7]

<table>
<thead>
<tr>
<th>Stage (grade)</th>
<th>Stage 1 (1st-2nd grade)</th>
<th>Stage 2 (3rd-4th grade)</th>
<th>Stage 3 (5th-6th grade)</th>
<th>Stage 4 (7th-9th grade)</th>
<th>Stage 5 (10th grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Life in Information Society</strong></td>
<td>-Information society and life change</td>
<td>-Understanding cyber space</td>
<td>-Cooperation in cyber space</td>
<td>-Cyber organization</td>
<td>-Right netizen mind</td>
</tr>
<tr>
<td></td>
<td>-Meeting neighborhood via computer</td>
<td>-Netiquette</td>
<td>-Prevention of cyber assault</td>
<td>-Ethics in cyber space</td>
<td>-Understanding information security laws</td>
</tr>
<tr>
<td></td>
<td>-Right attitude for computer use</td>
<td>-Internet addiction</td>
<td>-Encoding and security program</td>
<td>-Encoding and information security technique</td>
<td>-Information society and vocation selection</td>
</tr>
<tr>
<td></td>
<td>-Right attitude for cyber space</td>
<td>-Information protection and password</td>
<td>-Protection and necessity of copyright</td>
<td>-Development and future of information industry</td>
<td></td>
</tr>
<tr>
<td><strong>Understanding Information Devices</strong></td>
<td>-Understanding computer components</td>
<td>-Usage of operating system</td>
<td>-Understanding computer operation</td>
<td>-Understanding of operating systems</td>
<td>-Operational principle of operating system</td>
</tr>
<tr>
<td></td>
<td>-Computer manipulation</td>
<td>-Understanding software</td>
<td>-Computer user setting</td>
<td>-Understanding and principles of network components</td>
<td>-Server and network structure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Use of utility programs</td>
<td>-Understanding network</td>
<td>-Understanding of network structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Use of secondary devices</td>
<td>-Understanding and application of information devices</td>
<td>-Formation own computer constitution</td>
<td></td>
</tr>
<tr>
<td><strong>Understanding Information Processing</strong></td>
<td>-Diverse information world</td>
<td>-Expression of number and character information</td>
<td>-Expression of multimedia information</td>
<td>-Understanding and Expression of algorithm</td>
<td>-Understanding and application of database</td>
</tr>
<tr>
<td></td>
<td>-Interesting problems and their solutions</td>
<td>-Understanding problem-solving process</td>
<td>-Expression and Strategy for problem solving</td>
<td>-Simple data structure</td>
<td>-Understanding programming process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Basics and understanding of programming</td>
<td>-Input/output programming</td>
<td>-Production of application programs</td>
</tr>
<tr>
<td><strong>Information Manufacturing and Sharing</strong></td>
<td>-Life and information communication</td>
<td>-Information search and gathering in cyber space</td>
<td>-Creation, management and communication of cyber space</td>
<td>-Information sharing and cooperation</td>
<td>-Multimedia data processing</td>
</tr>
<tr>
<td></td>
<td>-Meeting with cyber space</td>
<td>-Document Edition and Image Production</td>
<td>-Numerical data processing</td>
<td>-Environment setting for information communication</td>
<td>-Operation and management of web sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Production of</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.2. ICT Application Education

According to MOE & HRD plan published in 2000, years of applying ICT application education for elementary schools, middle schools and high schools are summarized in <Table 3>.

<table>
<thead>
<tr>
<th>Year</th>
<th>Elementary school</th>
<th>Middle school</th>
<th>High school</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1st to 2nd grade</td>
<td>7th grade</td>
<td>-</td>
</tr>
<tr>
<td>2002</td>
<td>1st to 4th grade</td>
<td>7th to 8th grade</td>
<td>10th grade</td>
</tr>
<tr>
<td>2003</td>
<td>All schools</td>
<td>All schools</td>
<td>10th to 11th grade</td>
</tr>
<tr>
<td>2004</td>
<td>All students</td>
<td>All students</td>
<td>All students</td>
</tr>
</tbody>
</table>

According to recommendation of MOE & HRD, each course is recommended to include more than 10% of study activities by using ICT. That is, each course is redesigned to include ICT-related activities based on course characteristics and contents of ICT literacy education for students. Therefore, each school must consider reflecting more than 10% of ICT before teaching-learning guide plan is established.

3. Infrastructures Supporting for Adapting ICT in Education

In this Section, various infrastructures supporting ICT education in Korea are discussed. Those infrastructures respectively include laws and regulations, support for outstanding Municipal and Provincial Offices of Education, and provide educational information standardization [3].

3.1. Laws and Regulations

Currently, ICT education is encouraged and protected by various laws and regulations in Korea. Especially, according to Article 23 of the Basic Law of Education, government and local autonomous bodies...
will foster educational information projects and support ICT use in education. Also, various policies related to ICT use in education will be established and executed by the governments. Overall, laws can be classified into two categories, one for promoting ICT use in education and the others for preventing negative effects stemming from ICT use in education [8].


3.2. Support for Outstanding Municipal and Provincial Offices of Education

Since local self-governing system was introduced, a comprehensive evaluation of Municipal and Provincial Offices of Education has started from 1996. As adapting ICT in education becomes national policy, it is necessary to support outstanding Municipal and Provincial Offices of Education. The main goal for evaluating the level of ICT used in Municipal and Provincial Offices of Education is to encourage sound competition among them, and to increase the level of ICT use in education. In other words, the purpose of evaluation is to facilitate widespread of ICT use by Municipal and Provincial Offices of Education. These result in facilitating ICT use in schools. Financial support and oversea training opportunities for outstanding members have been provided by outstanding Municipal and Provincial Offices of Education.

3.3. Educational Information Standardization

Educational information standardization is an essential to information distribution. The uniform standards promote the sharing and creation of quality contents. Also, standard metadata allows people to access educational information in quick and convenient manner. Initiated by the “2003 Promotion Plan for using ICT in schools” that emphasized the importance of developing standards for educational information, KERIS (Korea Education and Research Information Service) has begun developing educational standards. KERIS developed a Korean Educational Information Metadata Format, based on SCORM that was recommended to ISO (International Organization for Standardization) by IEEE Learning Technology Standards Committee, in 2001. Based on the Korean Educational Information Metadata, metadata for “National Educational Resources Sharing System (NERSS)” was developed. All
4. Conclusions and Future Directions

In a knowledge-based society, ICT is essential to the process of collecting, processing, analyzing and organizing data since ICT can support synthetic management of tremendous data for human. In education, ICT can provide many advantages. It can overcome time and space limits existing in traditional classrooms, provide new information to students and teachers, support students’ individual study and cooperation work, and provide authentic circumstances.

In this paper, the current status of ICT education in Korea is discussed. First, the basic principles and goals to be achieved by ICT education are introduced. And, the current status of ICT education in Korea is discussed. Also, infrastructures supporting for adapting ICT use in education are introduced. Those infrastructures respectively include laws and regulations, support for outstanding Municipal and Provincial Offices of Education, and educational Information Standardization.

ICT education in Korea has been started mainly since 2000. Thus far, government, especially MOE & HRD (Now MEST), has initiated ICT education. Also, general infrastructures including curriculum, laws and regulations, supporting programs for students and teachers, standardizing educational information, and online comprehensive educational information system service are seemed to be established. However, for practical points of view, actual implementation of ICT education in class level is not matured yet. First of all, in elementary and secondary schools, there are no mandatory classes to teach ICT education. So it is necessary to acquire dedicated computer classes. Also, for ICT literacy education, due to lack of practical materials and practical guidelines, teachers may have difficulties in how and what to teach in classes. On the other hand, many computer programs and multimedia tools must be developed and distributed for encouraging ICT application education.

References


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